Industrial Finishing

Reg. U. S. Pat. Off.

An Independent Publication Devoted to the Finishing of Industrial Products

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(Continued from page 2)

for electrical specialties and aluminum ware, etc. We are, therefore, interested in locating a formula for making our own reducer for our requirements. If you are in position to furnish us with this information, or put us in touch with sources that will be able to furnish same, we will be very much pleased to have you do so.—M. W. Corp. (Pails, Tubs, Kegs, Barrels)

Pot Bottom Finish

We have noted on the market aluminum ware which has bottoms finished in some black heat-conducting material. Are you familiar with this and can you give us any information as to who puts out this material—and what is the process used in applying it? Any information you can give us will be appreciated. We suggest you send this along by return airmail, marked for the attention of the writer, purchasing department.—L. F. & C. (Household Appliances)

To Stripe Imitation Tile

Please tell us in the enclosed stamped envelope where we can secure a small gravity striping gun, or some other suitable instrument for laying a small 1/8-in. stripe in the shallow grooves of an imitation tile board made of "pressed wood." We presume this is the usual method of performing this operation. The purpose of the stripe of course, is to imitate the cement in the tile joints. —T. S. Co. (Unusual Products in Wood)

Waterproof Shellac

Will you please give us the name of the firm who recently advertised "Waterproof Shellac" in INDUSTRIAL FINISHING?—S. G. Co. (Display Equipment)

Questions Tumbling

As a reader of this magazine for the past five years I have been interested in the various items on tumbling finishes. Of late, I have noticed several articles about tumbling lacquers, equipment, procedure, etc. In my travels as an industrial demonstrator (free lance at the present time) covering the New England states, I have yet to see or demonstrate a satisfactory gloss lacquer finish which is obtained wholly by the tumbling method.

I have been shown single samples

(Continued on page 46)

From the Editor's Desk

New Way of Selling AFTER reading "To Meet New Conditions," pages 9, 10 and 11 of August INDUSTRIAL FINISHING, C. D. Young sizes up selling now and in the future as follows:

"This New Era of business with its lessened buying power, its keener research into materials, its more intelligent pursuit of operation economy, its consequent scrapping of methods and procedure which have existed almost from time immemorial, has resulted in a violent upheaval which has thrown into discard the salesman who would not study industrial trends and needs, and apply such information in his daily work. In his stead is the new salesman who offers more than the mere opportunity for purchase.

"This new industrial finishing salesman knows his own proposition thoroughly; he has personally tried out and tested the materials he offers for sale; he has confidence in himself, in his house and in the future of business. He is also willing to study the details of industrial finishing in all their aspects, whether or not they pertain to his own particular field of finishing, and is able to offer suggestions which will be beneficial."

We might add the fact that finish manufacturers are seeking and training just such salesmen, and finish users are eagerly welcoming them and listening to their suggestions and recommendations. Remember, *"The better job one can accomplish in doing the thinking for others, the more he is in demand and the greater is his reward."*

This applies in every phase of every business and it accounts for some of the remarkable successes among individuals and organizations.

Getting Ready MORE inquiries for information about (1) cleaning, finishing and polishing methods, (2) sources of supply for finishing materials and equipment, and (3) professional men, indicate that many concerns are "beginning to get ready to start" to accelerate industrial activities.

There seems to be considerable interest in lacquer thinners, reducers and stains, and in tumbling and dipping equipment, although other letters mention novelty lacquering, wood putty, striping, silk screen stenciling, pearl essence, fiber and aluminum finishing, etc.

Two letters, both referring to articles published in June 1931 INDUSTRIAL FINISHING, came from one concern early this month. The value of keeping all old copies of INDUSTRIAL FINISHING was strongly emphasized in these communications.

W. K. Rohr

Managing Editor

Fighting!

Never before has gameness counted as it does today. Never before have courage and fighting spirit been so vitally important. In today's struggle, industrial finishers are scrutinizing costs, analyzing production methods and examining equipment, to find every possible saving in finishing operations which so largely affect production costs.

Too often, improper exhausting equipment results in an unsatisfactory finish and causes extra needless operations. Too often, worn out spray guns, clumsy handling methods or other inefficient units or accessories in your set-up, waste material and slow up operations. Take the DeVilbiss man with you into your plant. With his long experience and wide knowledge of product finishing operations, he can help you ferret out waste; he can tell you how other finishers, facing the same problems you do, have improved the finish on their products and lowered costs. No DeVilbiss representative will try to sell you equipment you should not have; he will suggest only such investment as will pay its way in reducing costs. Send for him. Or write.

The wide and comprehensive experience of DeVilbiss engineers in designing special automatic and semi-automatic equipment is available to meet any new and unusual finishing requirements in your plant.

DeVilbiss

THE DEVILBISS CO.
Toledo, Ohio

New York . Philadelphia
Cleveland . Detroit . Chicago
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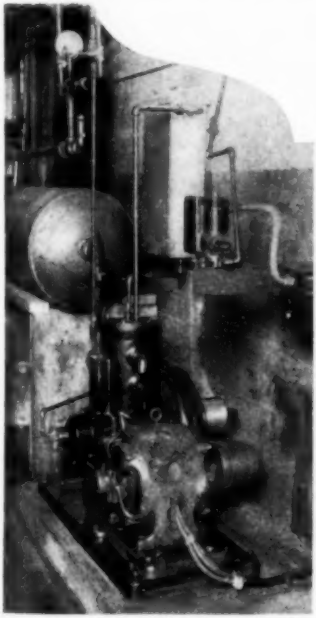
Direct sales and service representatives available everywhere.

Air Compressors

by F. T. HARRISON

Spray finishing, pneumatic rubbing, air blast cleaning, sand blasting, paint agitating—all depend upon compressed air which is (1) supplied by air compressors, (2) transmitted through pipe lines, (3) cleaned, conditioned and controlled by various suitable devices, and (4) used by shop workmen more or less experienced.



A 3x4" water-cooled compressor (vertical type). "No repair costs in four years."

WHEN SELECTING a compressor to supply air for finishing, be sure to get one of ample capacity, both as to volume as well as pressure. This must be determined from the number and type of air-operated devices to be supplied—for example, air-operated machines or accessories in other parts of the plant and the outlets for air rubbing machines, spray guns, cleaning guns, agitators, etc. Different makes of the same equipment may require varying volumes and pressures of air. The manufacturers will supply this information.

If the equipment requires, say 45-cu. ft. of air per minute, install a compressor larger than what would be rated at 45 or even 50-cu. ft. per minute displacement. Air compressors are rated at their displacement capacity, which means the volume of the cylinder displacement times the revolutions per minute. The air actually delivered varies considerably in different makes of compressors and, also in all compressors, with the pressure—the higher the pressure, the lower the efficiency. For a single-stage compressor, an efficiency for small sizes of from 65 to 75% at 80-lbs. pressure will not be far amiss.

Installation Suggestions

When installing the compressor, put it in as cool and clean a place as possible—never near spray booths or spray discharge. If the air at the compressor is unclean

then the suction intake should be placed outside the building or some place where clean air is available. If the intake pipe is more than 10-ft. long, increase its size to the next size larger than the suction opening of the compressor. If it extends outside, invert the end of the pipe and place a screen over the opening to prevent leaves, paper or other light material from being drawn into the line.

All air compressor manufacturers send instructions with each compressor regarding lubrication, installation and care. Do not destroy these or throw them away. Read them carefully! It will pay you, as they are sent with the machine for your benefit.

Water-Cooled Compressor

A water-cooled compressor for continuous duty has advantages over the air-cooled machine. Air cooling pre-supposes a relatively high, cylinder-wall temperature to provide for radiation of the generated heat; the effect of this is to make for much slower cooling of the air being compressed than is the case where the cylinder wall is cool; the practical result of which is to lower the efficiency of the compressor relative to power consumed.

The uncertainty of the maximum temperatures to which the cylinder walls may rise, when an air-cooled machine is in service, prevents the manufacturer from keeping the piston clearance at a better minimum; and piston clearance is a vital factor in the volumetric efficiency of a compressor. The temperature of compressed air from an air-cooled machine being higher, the likelihood of the moisture being carried far into the system before being precipitated is greater. However, the ideal selection must often be sacrificed to price, and is allowable where a very small quantity of air is required, or where extreme portability is of greater importance.

Air cooling prescribes limits of cylinder diameters beyond which air cooling becomes very bad practice. The water-cooled machines, on the other hand, may be made in generous sizes and for operating speeds that are much higher than the air-cooled machines, so in anything larger than a size of 3x3½-in. (piston displacement), the advantage is all on the side of the water-cooled machine, especially so for the stationary installation.

Lubrication of Compressor

The ease with which automatic oiling of the vertical type machines is accomplished is a feature of great value and perhaps an overshadowing advantage, except in large size machines where the manual or otherwise than gravity-actuated, automatic oiling systems may be conveniently controlled within the safe maximum allowances. In these large sizes, horizontal construction permits of more satisfactory mounting.

The oiling system of a compressor, intended to supply air for finishing, should be especially designed for this class of work, as it goes without saying that lubricating oil in finishes is fatal. Larger bearings and better forced-feed lubrication will permit higher speeds.

A governor of the type that operates in such a manner as to open the suction valve is recommended, as this permits the cylinder walls to cool while the compressor is running idle.

When air is compressed, it becomes heated to such a degree as to offset the tendency toward precipitation of its moisture content

caused by the compression itself. The capacity of air for water doubles with each rise of approximately 20° in temperature, while its capacity for water is reduced merely in proportion to the compression, from which it will be seen that precipitation of moisture does not begin to occur until the compressed air has cooled.

Pipe Drainage

As the air flows upward through a very liberal size vertical riser to the highest point in the system, an unusually great amount of condensation will be thrown out of the air stream; this should be collected just beyond the elbow through which the air stream turns to be conducted horizontally—the point of lowest temperature and minimum moisture content. From this point to each point of consumption, the pipe line should be carefully graded downward and provided with drip pockets and blow-off valves just before use in the machines. This drainage of the pipes should have careful attention, so that there will be no accumulation of "slugs" of water and oil that are bound to be expelled sooner or later with disastrous results to the finish of some particular job, or to a rubbing machine.

Precipitation of Moisture

There is sure to be a constant precipitation of moisture all through the pipe line and the thing to do is to recognize it and cope with it, rather than ignore and neglect it. Wherever air flows through a pipe, a drop in pressure is contemplated, and this means an increased tendency to drop water. There is a constant tendency of pipe fitters to use small sizes of pipe wherever possible, but in connection with compressed air this practice should be strictly avoided; in a general way the bigger the pipe line, the better.

A small pipe causes such a drop in pressure and consequent lowering of temperature that the precipitation will be heavy, whereas the large pipe line causes very little loss of pressure, and hence temperature, and the slower-moving current of expanding air has more chance to recover its heat through conduction through the pipe from the surrounding atmosphere. As a result there is less precipitation, and less refrigeration at the gun nozzle, hence less chilling effect on the finishing material. Specifically, 1-in. pipe lines to spray booths are none too large.

The importance of trapping the moisture at the highest point, as mentioned before, cannot be overestimated. If this condensation is allowed to follow through the pipe lines it will be re-absorbed by the air at lower pressure and higher temperature than that at which it was precipitated—a condition always present.

From the above it will be seen that at every expansion of the air, there is a tendency to precipitate water, especially if this expansion be very marked and of such a degree as to prevent sufficiently rapid absorption of heat from the surrounding atmosphere, due to a high velocity. Such a condition is present at the pressure-reducing valves usually employed on the gun side of the water-and-oil separator—which position is decidedly in error. This pressure-reducing valve should be placed before the separator so that the released moisture may be "captured" before doing damage.

At the Spray Booth

While at the spray booth end of the pipe line, it might be well to

mention that heating of the air, just prior to admission to the gun, will do much toward preventing the condensation of moisture from the atmosphere of the work room, in the presence of the refrigerating effect of the expanding air current from the gun nozzle. In point of fact, such heating is a true economy of compressed air. A steam jacket, surrounding a short length of pipe will increase the volume approximately 20%, and even if electricity at light rates were to be used for the purpose (neglecting the expense of renewing heating elements) it would be an economy.

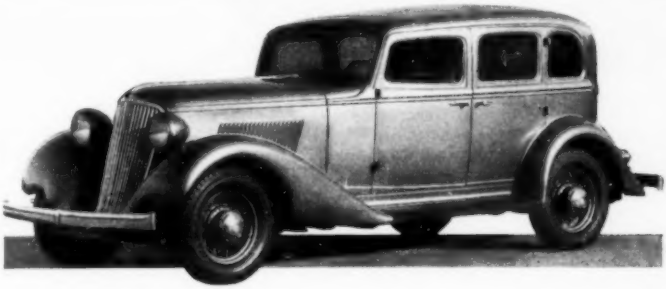
To PRODUCE an aged antique effect on period designed furniture, reproductions of antiques, etc., there is now available a new liquid material that can be applied with a sponge, brush or spray. It will not spot if more or less is applied over the same surface. This new material is waterproof and will not fade.

Automotive Radiators

IN ONE department of the Fedders Mfg. Co. plant at Buffalo, N. Y., automotive radiators are sprayed with japan which is baked on while the new radiators are moving on an overhead, motor-driven, chain-loop conveyor. One side of this loop is approximately 70-ft. long. The oven is about 30-ft. long, 15-ft. wide and 8-ft. high, and one loop of the conveyor extends some 40-ft. beyond to accommodate the spray booths and give flexibility to the unit in case of excess production, or interruption in handling. The chain makes five passes in the oven and emerges from the end opposite to which it entered. Right here is an extension of this conveyor, a loop passing down through the floor to the shipping room, and returning.

The oven is constructed of insulated sheet metal and is heated with six gas burners consisting of perforated pipes extending across the oven, and located close to the floor. An exhaust fan removes fumes through a vent in the top, and the proper temperature (about 450°F.) is maintained with an automatic temperature control.—J. B. NEALEY.

Discharge end of continuous japan oven, showing conveyor chain and hooks from which radiators are suspended. The motor and speed reducer are above at left.



Finishing Graham Cars in *Pearl Essence*

by WILLIAM G. HAARZ
Paint & Trim Engineer
Graham-Paige Motors Corp.

GRAHAM cars were the first to be regularly finished in Richelieu pearl essence. The new streamline eight, which was introduced early in December, 1931, appeared in various colors of the striking new finish. We have, therefore, had full experience with its use, as original finish and in repair work.

Because of its unique metallic-luster appearance, the first reaction of observers was to assume that its original application must be through some unusual or complicated process. In fact, at the New York automobile show where the public got its first real contact with pearl essence, those who asked questions invariably demanded to know what would happen if the owner of one of these cars should damage a fender. Some of these inquirers had the idea that the pearl essence finish was glazed on, like the porcelain of a bath tub or sink—and that if it suffered a smart rap, large flakes would drop off.

We first endeavored to educate our dealers in the nature of pearl essence and the technique of handling it, and they quickly learned that it presented no more difficulties than straight lacquer.

However, among those who have not had experience with it, pearl essence is still regarded with some suspicion, especially as regards the ability of a shop's painters to match it when the original finish must be repaired. Actually, this work presents no unusual difficulty.

To understand how a damaged spot, on a fender for example, is to be repaired, one should know what pearl essence is, and especially how it is applied in production to obtain good results.

The pearl essence itself is a compound of crystalline guanin (derived from the skin of certain kinds of fish) in a lacquer vehicle. The tiny flakes of guanin do not dissolve, but remain in suspension in the liquid; when the latter dries, the flakes are left to produce the iridescent effects caused by their breaking up the light rays. (The extra durability of the finish is due to the peculiar characteristics of the lacquer vehicle—not to the pearl substance itself.) To this mixture the color is added to attain the desired shade.

In production, the pearl essence finish is applied to Graham bodies over the same primers and surfacers as are used with plain lacquer. However, a ground coat is required, just as with most maroon lacquers.

The Graham finishing process is as follows:

After the body is properly sanded and rubbed out of surfacer, we apply two double coats of ground, which of course is the same color as that used in tinting the pearl essence for that car —a maroon ground for a maroon car, blue ground for a blue car, and so on. When the ground coats have dried thoroughly, we apply three double coats of the pearl essence. It is allowed to dry; then it is sanded with No. 400 sandpaper, applied just firmly enough to scuff the surface lightly. A mist coat (this is important) of high-grade thinner then is applied over the entire surface. Last come rubbing and polishing, with the same materials as are used for plain lacquer.

Now as to repairs: There has been a general belief in the trade that it is impossible to refinish a damaged spot properly, and that, if a door or fender be damaged, the entire unit will have to be done over.

The fact is, these jobs can be done in the field the same way they are at the factory, when a car becomes marred in production or testing or shipping. Here's how—and you will understand it better if you bear in mind the foregoing outline of how the original job was done.

If the spot is damaged clear through the primer down to the metal, it is most important that the area be thoroughly sanded to expose a clean metal surface, and that the edges of the surrounding lacquer be feathered down with sandpaper. Then spot in with pyroxylin primer and surfacer, which must dry thoroughly. The next step is sanding. Then comes the ground, same color as the finish. After the ground has dried well, the pearl essence lacquer is applied—the same number of coats as originally used. Then comes a light sanding.

Now comes an important point. The spot still lacks the final step of the original job, that is the spraying on of a mist coat of clear thinner. But, instead of confining the mist to the repaired spot, be sure to apply it over the entire area of whatever unit is being repaired, whether it is a door, fender, or body panel. It is this step that effectively blends the repaired spot with the rest of the surface, and it is essential to a good job.

In case the damage does not extend beyond the undercoats, it is only necessary to apply the ground coat and the pearl lacquer, and then the mist coat. Final rubbing and polishing will result in a repair that is barely to be distinguished on close inspection.

For the smart note in . . .

SMART METAL FURNITURE

ZAPON S-53

UP to the mode of the moment, Zapon offers a new fast-drying and water-resisting lacquer that was specifically created by THE ZAPON LABORATORY to give permanent protection and beauty to metal garden furniture.

S-53 is very economical. Most effectively used when thinned thirty to forty per cent. Sprays evenly and sets in a half hour. Hardens over-night to a tough, flexible finish. Only one coat is necessary.

The high gloss resists dust particles and moisture. Dries in a few moments after a storm or coating of dew. Sold in nearly all standard colors and tints.

If you require technical information on S-53, or any other lacquer, and its application, consult with The Zapon Laboratory by mail or wire. Our experience may help you solve a difficult lacquer problem.

"The Standard of Quality Since 1884"

THE ZAPON COMPANY

A Subsidiary of Atlas Powder Company

Stamford ZAPON **Connecticut**

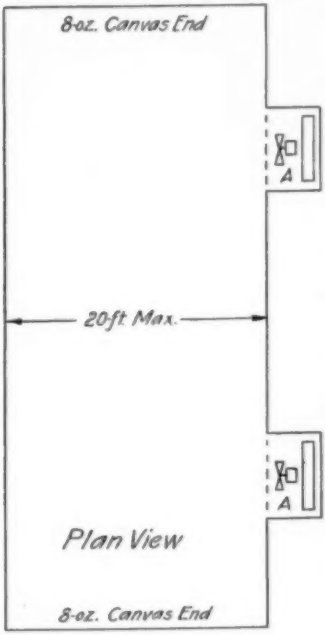
Drying Finishes Faster

by C. F. SCRIBNER
Industrial Engineer

WHILE THE COST of finishing materials in the average furniture plant will average about 3% of the total cost of the product, the time required for drying finishes, if not speeded up by mechanical means, results in piling up a considerable inventory of work-in-process, with its attendant cost charges.

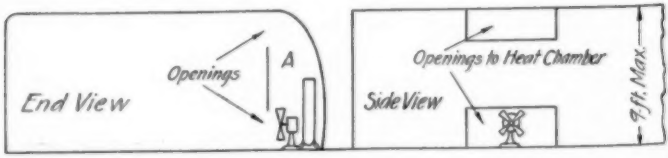
Not only is investment in work-in-process held at a high level, but the amount of floor space which is required in plants of even moderate capacity is out of proportion to the space required for the remaining operations in the plant. This also becomes a charge which must be brought into the finishing costs of production.

The tendency for buyers to limit their purchases to smaller quantities and to place on the shoulders of the manufacturer



"Some time ago I assisted a plant manager in securing increased production from his finishing department, by supplementing nature by mechanical means. The results were very satisfactory, both as to quality and reduction of cost. I am sure many foremen will be interested in an inexpensive method by which they can get more work out of their departments."

—The Author.



They Look at the FINISH!

And for that reason, the finish must be pleasing and in good taste. It must be attractive . . . it must have personality and character . . . above all, it must add sales appeal to your product!

Let our Studio create such a finish for you. Send samples for our artists to work with . . . and the service is free. There is no obligation.

ROCKFORD VARNISH CO.

ROCKFORD, ILLINOIS

responsibility for quick shipments, has made it important for the manufacturer to shorten to the greatest possible extent the finish drying time, consistent with the production of quality of product. To do this he has had to adopt mechanical means for quickening the drying process, with results which have been entirely satisfactory as to quality and of marked profit as to costs.

An inexpensive arrangement of a finish drying room, as adopted by one progressive plant, is shown herewith. The width of the room was held to 20-ft., and the length can be varied depending upon the capacity required. The ends and the front are enclosed with 8-oz. canvas curtains, and radiation sufficient for the required purpose is afforded by steam radiators placed at intervals along the front, with 12-in. fans used to obtain circulation of the heat from the heating chamber *A*, outward to the drying room proper. Humidity is controlled by a valve opening to allow live steam to enter the drying room.

In locations where there is a high humidity at certain seasons of the year, retarding the natural drying in the finishing room, this arrangement has had the effect of reducing the drying time one-half, without in any way affecting the quality of the product. Perhaps others who have a similar problem to meet will welcome the suggestions contained in this plan.

Color; Efficiency; Identity

Color is invading American industrial plants and making still greater efficiency. Take the case of a certain concern in the shoe industry. This firm painted its equipment and the interior of its plant with gay bright colors. Where a moving machine was in use contrasting colors were employed. A study of the effects on the workers, after the color plan had been in operation for some time, disclosed that (1) eye strain had been materially reduced, (2) less materials had been damaged, (3) no accidents had occurred in the plant over a period of nine months, and (4) a reduction in fatigue and nerve strain of employes was very noticeable.

Color has now entered into the making of the newest type of wire used in cables for electrical and other purposes. This new wire, of a flame-resisting type, is made in eight colors; each wire can be easily identified from either end of the cable through which it passes.—O. A. J.

Mass production and faster schedules have created a constantly increasing demand for automatic equipment in spray-finishing operations.

Utley Products Announcement

Utley Products Mfg. Co. of Chicago has just announced the appointment of Mr. J. L. Thompson as its exclusive distributor and factory representative throughout the United States and Canada for the Utway and Polydon lines of industrial finishes.

The appointment of Mr. Thompson is coincident with the Utley announcement of a new finish to be known as Polydon which is guaranteed proof against alcohol of any strength as well as moisture, salt water atmosphere, mild acids and alkalies and such solutions as are commonly found about the home, office, shop or hospital.

Mr. Thompson is organizing a sales company composed of men who are thoroughly familiar with the problems of the finishing room. The company will market this new finish under a unique plan of merchandising and which will be of genuine interest to every user of industrial finishes. Announcement of the sales company and its merchandising plan will be made in the advertising pages of this publication next month.

PURE SHELLAC

is the best sealer

especially if it is

Du-Pros Shellac

PURE SHELLAC is the standard of comparison for all other first coaters. Through many years of use, finishers are familiar with its quick drying, fine sanding, transparency, unexcelled sealing, extra good build, and trouble-free application.

At today's low price, pure shellac is the most economical first coater and sealer, wherever appearance and wearing qualities are a consideration.

But unless you use the purest shellac you cannot be sure of best results. Get the highest grade of strictly pure shellac! Buy Du-Pros. This is the brand name of the double processed, strictly pure shellac made by

JAMES B. DAY & CO.

CHICAGO

Du-Pros Strictly Pure Shellac, Lacquer, Stain, Enamel, Etc.

Finishing Hospital Furniture

by G. N. ROBERTSON

Sherwin-Williams Co.
Clear Lacquer-Varnish Division

MAPLE is largely used in the manufacture of hospital furniture, although some walnut is also used. The finish must be of high quality in both material and workmanship, as this furniture is subjected to rigorous and unusual service, and it must always present a clean, durable appearance. A finishing system for producing satisfactory results is recommended as follows:

1—Water stain; dry overnight.

2—Fill with paste wood filler, and allow to dry overnight.

3—Sand lightly.

4—The entire unit is dipped into a vat containing two parts oleum spirits and one part raw linseed oil. This mixture is sometimes applied by brushing instead of dipping the entire unit. This operation is for waterproofing. The unit is allowed to drain thoroughly; then it is set aside for drying overnight (preferably 24 to 36 hours). Special care must be exercised to see that the oleum spirits which escape from the mixture by evaporation are replaced; otherwise, too heavy a film of oil will be left on the surface which will cause trouble later on when the lacquer coats are applied.

5—Sand lightly.

6—Put on one coat of alcohol-resisting lacquer.

7—Apply a second coat of alcohol-resisting lacquer.

8—A third coat of alcohol-resisting lacquer is optional, depending upon the type of furniture being finished.

9—Rub and polish the following day after last coat of finishing lacquer is applied.

The above schedule has been found entirely satisfactory for finishing hospital furniture. It meets all the required tests, which are most unusual and severe. Some of these tests are as follows:

Water and Lysol Test

Add one teaspoonful of lysol to one gallon of warm water. Wash the finished surface with this solution once each day for two weeks. Finish must show no effects from such treatment.

Two maple plywood panels finished in the above schedule have been completely submerged for over nine weeks in lysol solution.

These have been removed at frequent intervals, cleaned and polished, and show no harmful effects from this test.

Alcohol Test

Alcohol is dashed on the surface. Although there may be some softening of the film, no permanent damage must be done.

Iodine Test

The finish must not be permanently injured by iodine splashed on the surface. It must be possible to remove iodine spots without damage. Iodine can be actually poured on the surface finished with alcohol-resisting lacquer No. 16 and allowed to dry. Then, by exercising reasonable care, the iodine spots may be cleaned off by the use of alcohol. The alcohol, of course, slightly softens the film, but it quickly hardens as the alcohol evaporates.

Oil of Peppermint Test

Oil of peppermint when dashed on the surface must not leave any permanent scars.

Gilders' Formulas

THE following formulas I believe will interest finishers in factories manufacturing lamps, picture frames and various novelties. I have used them and found the materials and mixtures satisfactory. If other readers of INDUSTRIAL FINISHING have something better, or if any question the merits of these formulas, I invite their comments, criticisms or suggestions.

Put 1-lb. of dry fish glue into 3-lbs. of cold water; soak this

TO PROVE QUALITY

Let us make YOU decide, AFTER you have actually USED our products. To do this, we are making an offer SO ATTRACTIVE, you CAN'T AFFORD to pass it up.

For 30 Days - We Offer

DOLCO LACQUER SHADING STAIN

ONE DOLLAR PER GAL.

Fast to light—clear—transparent.

STAIN POWDERS	ONE DOLLAR per lb.
Nigrosene	Red or Brown Mahogany
Bismarck Brown	Light or Dark Walnut

Penetrating Oil Stains

V. J. DOLAN & COMPANY, Inc.

"Unquestionable Quality"

Wood Finishing Supplies

1830 N. Laramie Ave. Chicago

overnight and then cook in a double boiler until the glue is all dissolved.

Stipple Paste

Use the following ingredients:

Glue (cooked)	1-lb.
Water (hot)	1-lb.
Alcohol (denatured)	1-oz.
Whiting (gilders)	2-lbs.

Mix the glue and hot water together; then add the whiting slowly while stirring. The alcohol is added last; this is to dissolve all bubbles so the stipple will not pin-hole. The stipple material should be strained through cheesecloth to remove lumps, and it should be kept warm while being applied. The design of the stipple depends upon the brush used and how it is held.

Red Clay

For making gilder's red clay use the following:

Clay (red)	1-lb.
Water (warm)	1½-lb.
Glue (warm cooked)	1-lb.
Alcohol (denatured)	1-oz.

Mix warm water with the clay until all lumps are dissolved; then add glue a little at a time, stirring continually. As the glue is added the clay will thicken at first, but it will thin down as more glue is supplied. The denatured alcohol is added last; this dissolves the foam and dissolves all bubbles.

Shellac Moulds

Melt, over a very low flame, 3-lbs. of dry orange shellac. When the shellac is melted, add ¼-pint of pine tar; this should be added slowly as it has a tendency to make the shellac boil over. This mixture should be stirred well before pouring it into the mould frame. These moulds are for quick "get-ups," and will stand from 50 to 100 castings. They will crack after they have been in hard service for a while, but when this occurs, they can be knocked out and recast by heating the shellac again and adding a little more pine-tar.

Gold Size

Add 4-oz. of cooked glue to 1-lb. of warm water.

Take three teaspoonfuls of gold powder and add enough denatured alcohol to make a thick paste. To this add ½-lb. of the glue size; this should be kept warm. (Note: If too much glue is added in making the glue size, the gold, when sprayed, will have a yellow or brassy appearance when it drys, and it will not burnish very easily. This can be fixed by mixing up more gold and only adding hot water. If the gold comes off when handling, more glue should be added into the gold mixture.)

Composition

For making composition material, proceed as follows:

Take 3-lbs. of dry glue and mix it into 2-lbs. of warm water; cook slowly until the glue is in liquid form; mix 2-lbs. of rosin into one pint of boiled linseed oil, and cook the same way as the glue. When these two mixtures are cooked (dissolved) pour the rosin into the glue a little at a time while continually stirring. This complete mixture is then poured onto a table that has had whiting sifted over it. It is mixed up the same as bread dough until the composition is dry enough to handle easily, when it is made up into loaves of about 1-lb. each and covered over with whiting to keep the moisture in the composition. As the composition is used, it is steamed on a cloth stretched across the top of a kettle that is about half full of water.—Jack London (Spray Work).

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DETROIT, MICHIGAN WALKERVILLE, ONTARIO

Modern Staining and a Complete *Mahogany Finish*

by Garrett F. Huizenga

Foreman Finisher lifts curtain to reveal an intimate close-up of the materials, equipment and methods used in staining, uniforming, shading, highlighting, filling, drying, sealer-coating, flat-lacquering, sanding, steelwooling, finish lacquering and final rubbing of quality finished furniture composed of solid mahogany, flat and bent mahogany veneered surfaces, and mahogany mouldings and carvings.

MANY articles have been written on finishing mahogany and other woods, but I have not seen any in which this new "no-sand" stain has been used.

I will try to bring before you how we use it, and also reveal a few things I have found in my line of finishing, which may prove helpful and interesting.

This new non-grain-raising stain is rapidly replacing the water stain, as it uses water-soluble colors and dyes, embodying all the good features of a water stain and removing the evil ones. This stain is absolutely fast to light, as it contains water-soluble colors. It can be matched to any color stain the finisher may have or desire. It dries in one to 1½ hours under normal finishing room conditions, will not bleed under shellac or lacquer; no veneer blisters, no disrupted grain, no joints soaked loose by stain getting into places not easily drained.

It may be dipped, brushed or sprayed. Penetration is equal to or greater than that given by water stains. This stain gives a wonderfully clear color, bringing out every bit of beauty there is in the wood. Every soft streak of grain is just a shade darker, this being caused by the soft part absorbing more stain than harder parts. This gives a very beautiful depth of color. On our particular color on mahogany, it is far more beautiful than water stain. To date, I have not seen one cloudy or muddy spot, as is sometimes found when using water stains.

For the finisher whose work is mostly on walnut and who has a great deal of sap walnut to contend with, this stain is a boon. The manufacturer will match your sap stain exactly. If a brush is used for applying the stain to sap streaks, steelwool should be used to blend it where it touches the darker parts after the stain has dried. Personally I like the spray-gun to match in sap streaks. I find a neater job can be done, entirely eliminating the lap at the edge of the sap streak—but that's walnut, and not mahogany.

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Dipping, Brushing Stain

The wood on which I have to do my finishing is mahogany—solid and bent veneer on the same piece. The dip method is used on most pieces, although some pieces have to be brushed on account of special veneers and marquetries. A tank large enough to accommodate the largest pieces is necessary; it must have a tight-fitting cover as evaporation is rapid. A drain cock at the bottom is also essential for draining and cleaning the tank. After an article is dipped, a few moments are allowed for the stain to penetrate; then a sponge is used to level off the excess and even the stain. The sponge must be used wet enough to even the color, and dry enough to pick up excess stain.

The stain may be made to use for a straight dip method; by this I mean the sponge is to be used only where excess stain gathers on mouldings and in corners.

Compressed air is very valuable in blowing out the excess stain from around carvings and mouldings.

In brushing this stain a small amount of butyl alcohol may be added with gratifying results, as this allows the man using it a bit more time to even his color. Butyl alcohol may not work in all the "no-sand" stains, but it did in those in which I tried it.

The manufacturer supplies the necessary reducer for making stain lighter and to allow one to keep a uniform tank mixture, and to allow for evaporation. The addition of the butyl alcohol is my own experiment and to me a "find" for brushing this stain.

Highlighting

After the stain is dry the article is highlighted. Here is where I had trouble, and it was a job indeed to find the cause and remedy. The filler would not "stay in" or fill the highlights. It acted quite the same as it does on Philippine mahogany. (We use only Honduras.) After careful study I had my man highlight a piece, using only sandpaper instead of steelwool, and to my surprise found a 100% better filling job.

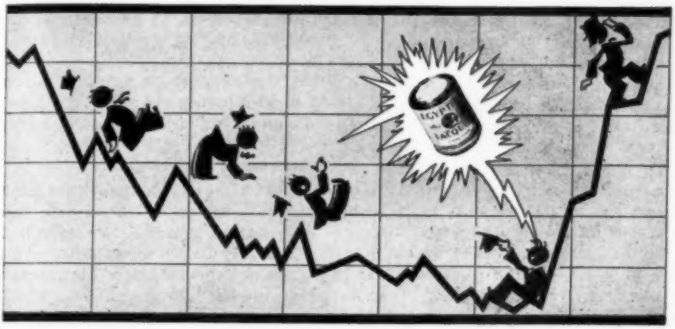
Sandpaper does not make as neat a job on highlighting as steelwool does, because the steelwool is more flexible and can conform more easily to the contour of the case or mouldings. To remedy this, sandpaper was used first and steelwool used only to blend out the highlighting. In using steelwool only, the sharp edge of the pore or grain is cut away, leaving nothing but shallow grooves to which the filler does not hold well.

Filling

The old brushing method of applying filler is still the best in my work and to my way of thinking. I mean brushing, not just "flopping" it on with a brush. Brushing the filler in is half of the job. In cleaning up, the usual tow and rags are used. I have my men keep a little pot of heavy filler handy to use on very porous pieces.

Double filled work has passed in our plant. I find it is a waste of time and material. Mix your filler right, brush it in well, work it after it has flatted, and dry it well before proceeding with finishing. Here is a little kink which may help some one who has a great deal of hand carved work to contend with: I know finishers who oil (linseed oil) the carvings to give them about the same color as filled work. Sometimes it does not work so well and of course the smooth parts of the carvings

Sometimes we're *glad* there's been a DEPRESSION



HONEST, we are! Here's why. Falling sales shake people up. They're willing to do things differently. They'll listen to new, sales-building ideas.

It's actually a great time to forge ahead. Some of our customers have been doing just that. Here's how:

By careful research they discover the need for new selling points in their product. They re-design. We are asked for new and more attractive finishes. A better product emerges. And it SELLS—*sells today!*

Of course business right now is not all it might be. But you should see the *small* orders pouring in here! They're samples, really . . . Experiments . . . Progress! There are good times ahead for those people who are working out better ways of finishing their products.

Are you going to get *your* share in the next period of prosperity? Will *you* be glad for the depression? Maybe we can help you to be. Call in the nearest Egyptian man and get his advice. No obligation, of course. It may turn the tide for *you.*

Egyptian "Lacquer" is listed in the following 'phone books:

Atlanta	Cincinnati	Kansas City	San Francisco
Boston	Cleveland	Los Angeles	Seattle
Buffalo	Dallas	Philadelphia	Spokane
Chicago	Detroit	Portland, Ore.	St. Louis

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are not filled. I take the mixed filler, add 50% naphtha, brush it on the carving only, and clean with compressed air, using plenty of pressure. I get a fine job and absolutely the correct color.

All filled work is gone over with a cloth to remove the lint of cloths used in filling—this after an overnight drying in a well ventilated kiln with correct temperature and humidity. If the humidity is not automatically controlled, pans of water should be set on steam pipes, or jets in steam lines may be used. Watch the hygrometer closely for correct humidity. On dry warm days I often sprinkle water on the floor before shoving in the racks of filled work, and I find the filler flint hard in the morning. Remember: Filling is the foundation of the finish.

Shading, Sanding, Sealing

All work is next touched up with alcohol stains if necessary; little spots of glue and light places are spot shaded with an air-gun.

A sealer coat may be used as a first coat; one that sands easily seems to be what every one wants. I find them—some of them—a bit too chalky and easily marred. Anyway, I don't need an easy sanding sealer, as our first coat is never sanded. All sanding is done on a flat lacquer (the second coat). Our sanding is done by girls and they surely need two coats to work on without cutting all the edges.

Now to draw the fire from the "Big Berthas": I insist and instruct that all sanding is to be started crossways of the grain, especially on the bent work. Of course, it must be finished with the grain. I find in starting across grain, the lacquer is cut down more level, and on two coats (one sealer and one lacquer) you have enough body to work on. The solvents in the last coat will "eat out" all sand-paper scratches.

My boss insists on a job that has the grain filled perfectly flush and smooth as glass. I get it easily, even on bent work, if all operations are done right—and I believe much of it is due to our cross sanding although some finishers may think it contrary to "Hoyle," but I get results since I started using this "contrariety." All our work is three-coat finished.

Lacquers; Rubbing

Sometimes on job work no clear lacquers are used at all; we use only flat lacquer, and we have had absolutely no cloudiness. All work is hand rubbed; this lacquer contains a flatting agent which permits easier rubbing than clear lacquer. All our lacquers come to us at spraying consistency and have been very uniform; we have had no lacquer trouble at all.

In rubbing, all work is smoothed up with No. 7/0 sandpaper, and No. 3/0 steelwool, using it dry. I find steelwool a real help in working into corners and mouldings. After this smoothing up and knocking off the dirt nibs, a neutral oil and F.F. pumice stone under a felt block are used for rubbing.

Some rubbing oils will turn white or bloom upon drying, presenting a very unsightly appearance. I formulated my own "wash" to use after rubbing. We needed a wash that would clean the cases and keep them that way. After rubbing, the work is given a few hours time to let the oil work out; then it is washed with this cleaner and they stay cleaned—compressed air being used to blow out around and in carvings and mouldings. I will not give the formula for the wash

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here, as it may be entirely too strong or not suitable for every kind of work, but if any finisher is having trouble I will gladly send him the complete formula.

This finish can by no means be cheap, as the articles on which it is used are top notchers in their line.

This may seem to be an expensive method of finishing in this day. True, it is not cheap. Mahogany can and is being finished much cheaper than by this method, but I know this finish will last—and that is the aim of our company.

Patching Pearl Finish

THE pearl lacquer finish on automobiles can be repaired so that the place will hardly be noticeable, if the work is done skillfully. First the surface must be properly prepared by cleaning off all wax or tar specks on the panel or space where the patch is to be made. Then feather down the edges of the old finish with abrasive paper, and finally remove the scratches with No. 320 wet or dry sandpaper. Spray on a coat of primer, let dry, and follow with a sufficient amount of surfacer. When dry, sand again with No. 320 sandpaper.

Remove the spray dust by wiping the surface clean with a clean cloth, dampened with naphtha or benzine (not gasoline). Apply the proper base color, and sand with No. 320 sandpaper, being careful to avoid sanding through the color coat. Remove the overspray by wiping the surface clean with a clean cloth dampened with naphtha or benzine. Apply two or three coats of pearl lacquer of suitable color in the same way.

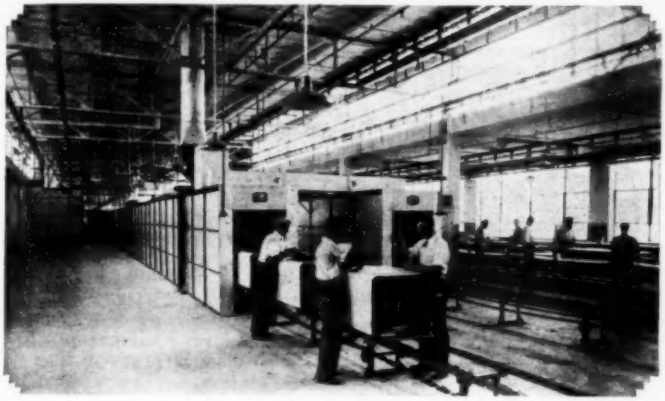
Spray the entire section or panel from top to bottom with pearl lacquer. The spray gun should be held slanting so that the overspray will always be ahead of the wet surface. Let dry, and if you are in a hurry polish the surface as soon as it is dry. If time permits, sand with No. 400 sandpaper. Spray on a mist coat of slow thinner, and polish when dry.

For a more refined surface on fender finishing, the strokes of the gun should be lengthwise of the fender—not crosswise. Mist coat the entire section at one time to "blend in" and "uniform" the color and luster of the repaired place and the space surrounding it.

It must be understood that the old surface of the pearl finished panel to be patched is to be thoroughly cleaned so that the finish coat will be applied directly onto a clean pearl finish coat. Use a cleaner that is free of oil or wax. Then clean the surface well with a clean cloth dampened in naphtha.

If the old surface has been in use for a long time a coat of thinner, sprayed just before the pearl lacquer coats, will make a better amalgamation of the old and new pearl lacquer. If the finisher suspects that the car has been waxed, all of the surface that is to be coated with any new material should be cleaned free of wax with naphtha or benzine. Thinner should not be used as a cleaner because it would eat into the whole finish! This should be done even before any sanding is started. This prevents "grinding in" the wax.—M. V. LEACH.

As thinner is added to a lacquer enamel it has a tendency to speed the drying time, give greater penetration, and reduce the gloss of the enamel.



Synthetic Bake-Finishes

by C. DAN YOUNGS

The baking characteristics oven temperatures and checked results in reference to color durability and acid resistance.

THE NEW FIELD which the use of synthetic finishes has opened to the industrial finisher would not be complete without reference to their valuable asset in the realm of baked finishing.

The older well-known type of baking enamel of oil base has presented the finishing industry with many satisfactory and lasting jobs, and in turn has given at times some difficulty in securing proper results. Some of these difficulties have been inherent in the type of baking enamel used, but possibly an equal number of times the troubles could be traced to improper workmanship somewhere.

Baking the new synthetic type of finish is not at all a fool-proof operation, nor is there a cure-all for the various difficulties finishing is heir to. Good or bad results may be obtained—and from the same reasons as with the oil-base enamels, namely, improperly formulated materials and the wrong methods of workmanship.

Variety of Synthetics

The term "synthetic" has come into general use almost overnight, and was generated by the type of base material first used in the manufacture of "synthetic" finishes. Yet because this term is now used by practically all finish manufacturers does not imply that the materials, formulas, or meth-

ods of manufacture are all the same. There exists exactly as wide a variance in this field as does in the oleoresinous or nitrocellulose fields. The entire output of all manufacturers called synthetic, cannot be judged by experience with any one or two of these products.

Merits of Synthetic Finishes

Among the merits of synthetic finishes, one is that the white and lighter tints can be baked at a higher degree of heat for a shorter period of time. Some of these whites will turn out satisfactorily at from 200° to 250° F. when in the oven for only an hour. Others require a longer baking time, best results being obtained when the oven does not go over 175° F. Another advantage is the fact that the danger of a color change does not seem to be present; the white does not turn out to be an ivory, gray or cream.

These baking enamels seem to have a higher degree of lasting gloss as well as a greater flexibility than was contained in the old type enamels. They also possess greater durability, exceptional toughness, and a marked resistance to abrasion and the deleterious effects of coming in contact with oils, grease and certain chemicals. It seems that in the case of synthetics, high heat toughens the film instead of making it brittle, as would be the case with the old type oil-base baking enamels. It also seems that the higher the heat the greater the resistance to alkaline solutions.

Results of Tests

An interesting test was made which brought surprising results. A piece of metal was sprayed with an olive green synthetic baking enamel and baked in a natural gas oven for one hour at a temperature of 210° F. It was then submerged in a strong soap solution; within five hours it began to turn white. At the end of ten hours it was completely white.

A similar piece of metal was sprayed from the same can and baked for one hour at 350° F., and then immersed in the same soap solution. Inspection at the end of ten days showed absolutely no color change, although there appeared to be a slight reduction in the gloss.

This seems to bear out the manufacturer's statements that a higher heat strengthens the film and renders it less soluble in alkaline solutions. Tests as to reactions were not made with acids other than sulphuric; it seemed to have a marked resistance to a diluted sulphuric acid. It is probable that this same resistance will apply to alcohol and other enemies of finishing products.

How to Use Synthetic Finishes

In using this synthetic baking enamel, it is wise to use only the reducer which the manufacturer recommends especially for this material. When the writer attempted to reduce a synthetic baking enamel with the reducer supplied for use with an air-drying synthetic, it immediately became livered and unfit for use. However, this may not apply to all makes of synthetics, and it is probable that someone has developed or will develop a general reducer to be used with all types of this material.

No fear need be felt as to the durability of the appearance of baking synthetics if the work is properly handled, nor is there apparently any objection to their use by the workmen. It is true

metal furniture finishes made with

REZYLS

are *SMOOTH*
GLOSSY
TOUGH

REZYLS are tough, adhesive vehicles that produce finishes with exceptional gloss and depth. It naturally follows that Rezyl-formulated baking enamels are ideal for all kinds of metal furniture.

And what's more, if you ask for a REZYL type finish, you'll get color that lasts, economy in labor and materials, and remarkable durability!

Ask us about your finishing problems and what REZYLS can do for you

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that some of them seem to have an objectionable odor, but use of a spray mask while spraying will obviate any trouble from this source.

From all angles, it appears that they are the best to be had in the baking field, and that their use will become more common after tests have been made by more industrial finishers.

Limbs Lacquered

ARTIFICIAL limbs, made by the Aero Socket Artificial Limb Co. of St. Joseph, Mo., are hand carved to measurement from English willow, and sanded and buffed smooth. They are then wrapped tightly with wet rawhide which is spread with glue. Plenty of time is allowed for drying, this varying, of course, with the season and weather.

When thoroughly dry the surfaces are lacquered in a flesh color, the finisher using a high-grade lacquer and the thinner that comes with it in about equal parts. The lacquer is applied with a spray gun. When each coat is dry, it is lightly rubbed with fine steel wool, the last coat being rubbed and polished with pumice stone. From five to seven coats of lacquer are needed to bring the finish up to this company's standard of quality.—E. DEW.

Spotting Black Fenders

SPOTTING black enameled fenders with lacquer is not recommended for a permanently attractive repair job on new cars, especially in reference to taking care of fenders damaged on cars in transit or fenders on new cars in the hands of dealers, or on cars sold only a short time. In order to cover a spot where the bare metal is exposed, the black must overlap the exposed primer and surfacer in order to conceal it. If this is done there will be portions of black enamel around the spot covered by the black lacquer, and when the black lacquered spot is polished its edges are thinned to a feather edge, which soon becomes brittle and chips, showing distinctly where the patch starts and stops. For a first class job, it is best to prime and lacquer the entire fender—especially for the first time on new cars or on cars used only a short while.—M. V. L.

Color Replacing Chromium on Automobiles

Color is appropriate for use on every type of automobile radiator shell. In addition to the smart air of distinction this treatment provides, this practice of coloring the shells also engenders an illusion of greater length. The effectiveness of the result is particularly noticeable on cars that have straight rectangular front radiators. The perpendicular break afforded by the wide margin of chromium at the front end of the car becomes part of a long sweeping hood, once the shell is colored to match the remainder of the automobile body. Colored radiator shells have been high fashion on exclusive European models, as well as on custom cars in this country, for some years.—AUTOMOBILE COLOR INDEX.

The quality of thinner used in lacquer vitally affects the successful application and formation of the film, but since it all evaporates it has relatively no effect on the wearing value of the finish.

New Materials and Equipment

Color Matching Slide Rule

The Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland, Ohio, announces that the most practical and simplest method yet produced for exact matching and mixing of colors, is just being brought to the finishing trade—a color matching principle that enables a novice or a garage mechanic, after a little practice, to match and mix colors with exactness.

It is the slide rule principle of color matching developed by Dr. N. E. Van Stone, Director of Chemical Operations for the Sherwin-Williams Co., an internationally known chemist.

The ingenious device known as the "Slide Rule Color Match Guide" enables the painter to find and make a color match for almost any color, whether it be new and bright or old and faded.

Three hundred color matches are possible with the slide rule. The device carries the complete range of shades from light to dark in each color family. If the original finish on a car is gray the painter selects one of the gray cards which contains all the shades and variations of gray, and which are inserted in the book in loose leaf fashion on a ring binder. He then slips a celluloid mask over the card and places it against the color to be matched and slides the celluloid mask up and down until he finds a chip on the card that matches exactly the color of the car. Each one of the 300 color chips are numbered.

After finding the correct color, however, the painter's problem is practically solved. What colors and how much of each must he mix to obtain the matched shade? That question too is automatically answered by simply turning the card over to the reverse side without moving the celluloid mask. Here he finds the formula for the particular color in question—which may be gray color chip No. 14 obtained as follows: 18 parts yellow, 14 parts of red, 32 parts of bone black and 36 parts of white. Along with the directions for mixing the color the painter is automatically given two suggested trim colors to choose from, as well as an appropriate striping color.

The book also contains large felt-backed celluloid chips showing the regular ready-mixed body colors and the 32 mixing enamels furnished with the guide and from which any of the 300 colors can be produced.

The Slide Rule Color Match Guide is patented by Sherwin-Williams Co.

Alcohol Denaturant

Treasury Order No. 10, issued July 1, 1932, covering revisions in completely denatured alcohol formulas, provides for the use of Tecsol in C.D.A. No. 10 formula. Tecsol is a product manufactured by the Tennessee Eastman Corp. of Kingsport, Tenn.

The development of Tecsol is the result of over 12 months' research and experimentation in the laboratories and plant of the Tennessee Eastman Corp. which is a subsidiary of the Eastman Kodak Co., Rochester, N. Y.

Tecsol is a very complex substance

and is a result of selective cracking and extraction of various constituents obtained in the pyrolysis of hardwood. The production of such constituents for this purpose has been made the subject of several patent applications. This denaturing material was designed to replace in the completely denatured formulas the high-boiling hydrocarbons which carried odors offensive for certain alcoholic uses. While Tecsol is non-poisonous and carries no methanol, it does carry a warning but inoffensive odor, and its disagreeable taste renders alcohol absolutely unfit for beverage purposes.

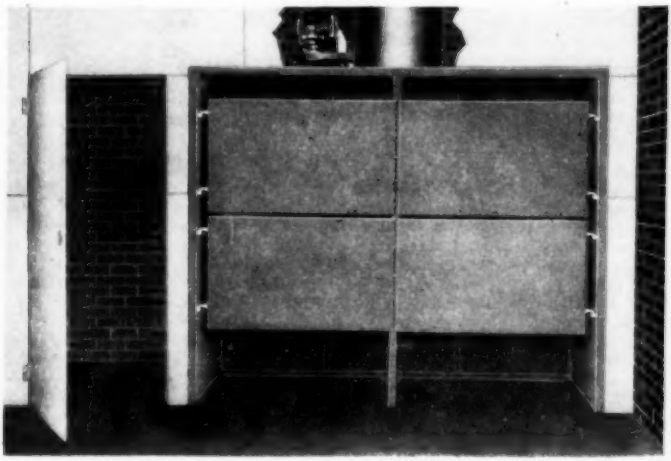
The new C.D.A. No. 10 formula embodying Tecsol, while primarily compounded as a solvent for the varnish, paint and lacquer industries, is available for all other completely denatured alcohol uses, including anti-freeze.

The new C.D.A. No. 10 using Tecsol is in no way offensive, and because of its lack of evaporative residue and freedom from high-boiling constituents it drys level and rapidly and therefore makes a most satisfactory alcohol for this use.

Spray Exhaust Chamber

The DeVilbiss Co., Toledo, Ohio, manufacturer of spray-painting and finishing equipment, announces a new type of exhaust chamber. This new exhaust chamber is recommended for use where spraying is done in an already fireproof room. It is designed to provide a means of mounting the exhaust fan and to distribute the exhaust properly where a complete spray booth is not required or where an exhaust fan mounted in the wall or window will not adequately take care of the requirements. In construction, this exhaust chamber is actually the back section of standard spray booths.

The DeVilbiss exhaust chamber is placed in the rear of the room and the exhaust pipe is run out through a window or the roof. The space around the chamber may be filled in flush in the front with sheet metal, tile or other noninflammable material, with a door providing access to the exhaust fan. This keeps the fan motor out of the spraying room. The chamber is constructed of 24-gauge sheet steel, reinforced on the



This unit supplies another need that exists in many spray rooms.

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Makers of tile, cabinets, boats, toys, refrigerators and any other industrial production utilizing these boards, will find it profitable to consult us.

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CLEVELAND, OHIO

edges by a steel frame spot welded. Three widths, 8, 10 and 12-ft., are available. All sizes are 32¼-in. deep and 7-ft. high. Exhaust openings are optional in the top, back or side. The unit is easy to assemble and to install.

How to Use Brushes

Before using a new brush clean out the few loose bristles by striking the bristles back and forth against your spread fingers. Then dip your brush in the material you are about to use and work it out on a board before beginning a job.

Dip your brush just far enough in the paint pot, which should not be more than one-half or two-thirds full, so that after dipping the end lightly against the inside of the can it will carry paint to the job without dripping. Don't wipe your brush on the edge of the pail, for the paint will dry there, and you will pick up the dried paint skins with your brush and get them onto your finished surface. Don't paint with the side of the brush.

Paint with the broad side of the brush; otherwise you will wear the brush into a point and ruin it. When using a round or oval brush hold it always in one position for the same reason. Sash tools, which are made to use edgewise, are the only exception to this general rule.

You will find that the paint or finish will spread more easily and your job will be smoother if you keep your brush handle at all times perpendicular to the surface you are painting, thus using the ends of the bristle and not the sides.

Paint brushes used in full oil paint may be laid out flat on a board for a few days without danger of hardening or spoiling the brush. Paint brushes used in flat or semi-gloss paints must be either washed out or suspended in the paint itself to a depth of about ¼-in. above the bottom of the ferrule. If a thinner, such as linseed oil or turpentine is available, suspend the brush in that. If the brush is not to be used for some time, wash with a solvent, then with soap and water, and put away for future use.

VARNISH BRUSHES: If the brush is to be used the next day suspend it in varnish, making sure the bristles are completely covered. If the brush is not to be used for some time, clean it thoroughly with turpentine and keep it in raw linseed oil. Be sure, however, before using again that it is thoroughly washed in turpentine.

COLOR BRUSHES: These brushes should be cleaned thoroughly with turpentine immediately after using and then suspended in turpentine.

STIPPLING BRUSHES: After using, loosen the paint in the tips of the bristle with a stippling motion against the bottom of a pan filled with turpentine. Then wash thoroughly with soap and water. Lay the brush on its side to dry.

FLOWING BRUSHES should be suspended in clear varnish.

SHELLAC BRUSHES should be cleaned at once with alcohol.

LACQUER BRUSHES should be cleaned immediately after use with lacquer thinner.—THE SHERWIN-WILLIAMS BOOKLET.

What Finish User Wants

How to get and hold customers? Give the customer valuable service in one way or another. Some manufacturers of finishing materials might follow the example of others, in shipping their materials in drums with removable heads and built-in, welded steel, hand-crank agitators.—H. E. J.

Questions and Answers

Sap Burl Fronts

We are finishing bedroom furniture in sap burl with reddish streaks in it, and we seem to be having quite a time to get it nice and even. We cannot seem to get away from the burl shading. One way you look at it the sap drawer is dark and the bottom drawer is light; from the other side the top drawer is light and the bottom drawer is dark. I should like to know if there is any way that this sap burl can be finished in order to relieve this difficulty and still have a light golden color in the burl.—F. G. W.

The difference in color between two pieces of sap burl taken from the same flitch is possibly caused by the fact that one of the pieces is laid with one side of the veneer "out," where the other piece is laid with the opposite side of the veneer "out." This is often done in matching figures in burl work. The pores or the wood run through the veneer at a slight angle and when two pieces of adjacent veneer from a flitch are laid with opposite sides "out," the light reflection or refraction is different because of the pores being at different angles in the two pieces of wood.

About all that can be done to overcome this condition is to either lay both pieces with the same face outward—which of course would mean that many of the matched figures so often seen could not be produced—or if opposite faces of the veneer are laid outward in order to produce a matched figure, then a stain will have to be used which leaves a considerable color on the surface of the wood and acts somewhat as a paint to partially hide the figure of the wood. Another way is to tint the varnish or lacquer applied over this figured wood so as to partially hide the scintillating effect which otherwise is produced by the refraction of the light.—C. F. MERRIFIELD.

Artificial Fish Bait

Referring to the item in March issue in regard to finishing artificial fish bait, the first and most important process is to waterproof the red cedar plugs after the machine work of shaping, drilling, etc., is done. The procedure I recommend for this operation is as follows: For equipment use a double boiling kettle, using steam for heat; have a wire basket that will fit easily inside of the solution container for dipping the

plugs. Prepare the following solution:

Dissolve 1-lb. of white, refined, powdered rosin in two quarts of pure turpentine. Heat to 190° F. in the double boiling kettle. Submerge the plugs in this solution, using the wire basket and weighting down the plugs to prevent them from floating; allow them to soak for 30 minutes. Remove them and spread them out to dry where they will be in a circulation of air; allow them to dry 24 hours. Care should be taken when performing this operation to avoid having a heavy sticky rosin film on the surface of the plugs, as this would retard the drying of any following coats. A sticky heavy rosin film may be due to the use of too much rosin, or by the solution not being hot enough.

After the plugs are thoroughly dry they are placed on fixtures for dipping by machine or by hand.

First, I suggest one coat of white lacquer surfacer which should be quite elastic. Allow this to air dry 12 hours. If necessary give a light sanding with No. 2/0 sandpaper. Next, apply one or more coats of lacquer enamel the color desired for body—the lacquer to be applied quite thin by dipping. Allow five or six hours drying time between coats.

The plugs are now ready for the various color scheme decorations—shading around the eye cavities and down the back, etc. This work can be done with a touch-up spray gun, with the spray cut down to allow only a fine mist of material. This coloring or shading can be done with lacquer enamel thinned to the extent of equal parts enamel and thinner. An imitation scale effect can be done with decalcomanias.

Next operation: Attach hooks and other fittings; all screws and pins are to be set with lacquer cement to make the wood bait water tight. For a final finish, after all fittings are attached, apply by dipping, one or more thin coats of clear gloss waterproof lacquer. This kind of finish has stood up under several severe tests—J. E. GREENE. (Demonstrator)

Synthetic Lacquer Reducers

What reducers are suitable for synthetic enamels and lacquers used for coating or finishing birch and maple handles for kitchen utensils?—J. D. S. (Woodenware)

Reducers for synthetic enamels are generally one of the coal-tar hydrocarbon solvents obtainable from chemical and solvent manufacturers. Reducers for nitrocellulose lacquer products are all mixtures of two or more liquids easily prepared by anyone with a knowledge of lacquer-type materials; but advisedly the reducers ought to be secured from the manufacturers of the lacquers used, because the reducers must be compatible with the lacquers and of such type as will provide the specific characteristics required in the usage of the lacquers for various purposes or manner of manipulation—whether brushing, spraying, or dipping.

Unfortunately at this time, when the number of different types is legion, the term "synthetic" is too loosely used and is not at all indicative. Under this general caption there are some kinds of synthetic-resin products which readily assimilate the ordinary mineral thinners (petroleum naphthas) and also turpentine. Many others are partially miscible with the petroleum thinners and

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require up to 25% coal-tar solvent in the combined mixture or reducer. Some others will not combine at all with petroleum thinners.

Of the second group mentioned, oftentimes the petroleum thinner (which might be dry cleaners' naphtha, gasoline, or the high-flash paint thinners) may be necessarily added in excessive amount before the viscosity or consistency of the varnish appears to be reduced. This condition usually results from insolubility of the varnish in the diluent, whereby a sort of colloidal condition is set up and a swelling of the varnish occurs instead of the desired cutting of the body of same.

Obviously excessive thinning lowers the solids content of the varnish or the varnish in the pigmented enamel, producing resultant coatings of more-or-less thinness on the work and, in the case of pigmented coatings, a more-or-less dulling to flattening of the gloss.

For retention of the solids (resins and oils) in the varnish vehicle, and of the natural gloss and fullness of the coating material, the reducer for same should have good solvent properties so that a minimum quantity added will sufficiently reduce the consistency of the enamel for proper application. Generally this is accomplished most efficiently by using one of the coal-tar solvents, straight.

By knowing their rates of evaporation, you may be guided in your selection for the work in hand, realizing that the slower the evaporation the longer the coating reduced with that type will remain "open" or wet and workable. This is usually desirable in brushing jobs, and to reasonable and proper extent in dipping goods to allow ample time for draining and with eventual gradual setting-up free from sags and tits. On the other hand, usually the faster, more volatile thinners are used for spraying application whereby practically immediate set takes place—with no more flowing other than to the extent of leveling-out the pock marks or pits from spray pressure.

For your information recomparative volatility of the three coal-tar solvents most frequently used, the following schedule was determined by evaporating 5-c.c. of each solvent in a small dish and at room temperature:

Benzol (90%) completely evaporated in approximately 15 minutes;

Industrial pure toluol evaporated in 36 minutes;

3°, 5°, 10° xylenes (xylols) in relatively 76, 81, and 89 minutes, respectively;

Industrial xylene (commercial xylol) in 108 minutes;

Crude Light Solvent Naphtha in 126 minutes; and in comparison with these coal-tar solvents, the following common thinners—

V. M. P. naphtha (petroleum) evaporated in approximately 175 minutes;

Hi-flash naphtha (185° end point) in approximately 310 minutes;

Pure turpentine required approximately 450 minutes evaporation time.

Probably the preferable solvent, at least as customarily used, is "commercial xylene" (commercial xylol) which is lower grade than the three standardized distillations recorded above.

Lacquer reducers are combinations of solvents and diluents, and with the addition of certain slow-evaporatives and (or) plasticizers they are used as retarders.

Typically, wood finishing lacquers contain nearly equal parts of gum and cotton, therefore the reducers for same can run higher in diluents so long as the diluents

are good solvents of the gum or resins; whereas automobile lacquers for outside wear contain about one part of gum and three of cotton, consequently the reducers must carry more true solvent of the cotton. Regardless of this, reducers are indiscriminately offered and used on price basis—of course with attendant grief. The following line of lacquer thinners all represent dependable types for their respective qualities, ranging downward in cost and price. The percentages stated are on the basis of weight, because all lacquer formulation should be accurately based on weight and not on volume measurement.

	Butyl Acetate	Ethyl Acetate	(Butanol) Butyl Alcohol	Toluol	No. 5 Alcohol	Secondary Butyl Acetate	Cleaners' Naphtha	Total
No. 1	28.16	28.89	26.52	16.43				100%
No. 2	23.18	7.27		69.55				100%
No. 3	4.80	41.00	4.70	40.00	9.5			100%
No. 4	9.07	18.54		69.64	2.75			100%
No. 5				30.00		30.00	40.00	100%
No. 6		16.38			83.62			100%

The above percentages may be considered as "pounds," and actual mixing of the liquids done on this "pounds basis."

The No. 2 formula is recommended particularly for clear lacquers, for either metal or wood finishing.

The No. 1 formula is for all pigmented lacquers. This reducer insures better bonding between coats of lacquer.

Both the No. 1 and No. 2 are very free from tendency to blush, unless the lacquers in which they are used are very lean in high-boiling solvents. Thousands of gallons of these two reducers have been sold with entire satisfaction. —E. PERRY

Color harmony exerts a powerful influence on sales of finished articles.

A Dull Finish with Shellac

We have on hand a few refinishing jobs which require a cheap finish. We would like to find a method of applying shellac by brushing, so as to produce something resembling a dull varnish finish. Is there any ingredient we could put in the shellac to give us this effect? Will you suggest a good method for producing a dull finish after brushing on the shellac?—R. V.

In reference to giving a shellac finish a dull appearance, a dull effect can be obtained on shellac the same as on a furniture finish, namely by rubbing the surface with pumice and oil—or for a still better effect, if the operations will permit, rub with No. 6/0 or 8/0 steel wool dipped in liquid wax. This produces a wonderful finish, but if you do not care to use the wax, the effect you desire may be obtained by the use of the steel wool alone.

Some shellac substitutes will give the same result without rubbing.—E. B. C.

Lacquer Thinners

We have been told that we could get some information from you as to the composition of lacquer thinners. We are particularly interested in such thinners as use toluol, xylol, etc. Can you give us any information along this line or refer us to a source for

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Write for free liberal sample and schedule of attractive prices.

O. R. PLATTER
North Vernon Indiana

such information?—A. B. P. Co. (By-Products).

The lacquer industry consumes a great deal more than half of the entire production of toluol and xylol.

In the first place toluol and xylol are not, in themselves, lacquer thinners. On the other hand they are used very extensively in making lacquer thinners. Toluol and xylol are both definite chemical compounds and are known as aromatic hydrocarbons. These hydrocarbons, toluol and xylol, are mixed with aliphatic esters and alcohols to produce what is known as lacquer thinners. As a general rule the proportion of toluol and xylol is from 50 to 60%. As an illustration, I am giving below a formula for a good grade of lacquer thinner:

Butyl acetate.....(% by volume)	25
Butanol	10
Ethyl acetate	10
Toluol	55

Xylol evaporates somewhat slower than toluol and is therefore used to replace some or all of the toluol to slow down the evaporation of the thinner. Other solvents than those given are used to produce different effects.—C. W. Simms (Lacquer Specialist).

The constituents of all lacquer thinners may be roughly divided or grouped as follows:

1—Active Solvents, 15 to 25%

This group embodies a wide range of ethers, esters, and ketones, that are derived principally by the action of acids (inorganic and organic) upon alcohols. Their function is to dissolve and hold in solution the solid matter that forms the base of the film of a lacquer finish.

2—Latent Solvents 5 to 20%

Alcohols ranging from ethyl to amyl alcohol comprises this group. These substances dissolve gums and resins used in finishes and become active solvents for nitrocellulose in the presence of ethers and esters of (1) above. Their function is to insure even and uniform flow-out in the film.

3—Diluents 55 to 80%

Hydrocarbons of both the aromatic and aliphatic series supply this third group of thinner constituents. Toluol is by far the most important member of this group. It should be noted that although this diluent group comprises more than 50% of the total volume of a lacquer thinner, its function is that of a vehicle or means to an end, and since its status approaches that of a lost in transit article, it should, for economic reasons, be as cheap as is commensurate with a suitable finish.

Xylol is a higher boiling, slower evaporating, hydrocarbon, derived from the same series as toluol. It finds limited application in the formulation of special high-humidity-resisting thinners. Its use retards drying time and aids in blush resistance.

From the foregoing outline it is obvious that lacquer thinners may vary widely in their composition, notwithstanding the fact that but three general groups of substances enter their make up. In actual practice it will be found that almost every combination of solvent, latent solvent, and diluent is used to meet the varying demands of the finishing trade, depending upon the type of finish desired and upon the mode of application, whether it be spraying, dipping, or brushing.

Naturally, this flexibility in design of a product is conducive toward the promotion of a number of versatile uses which the older types of finishes could not successfully meet. In my opinion this inherent ability to change with changing conditions is in a large measure responsible for the success of the lacquer finish, since all progress is susceptible to measurement in terms of a psychological yard stick which we know as adaptability.—ELLIS W. COATES (Consulting Technologist).

Represents Rauh in Cleveland

Robert Rauh, Inc., Newark, N. J., manufacturers of synthetic resins and ester gums, are pleased to announce the appointment as their Cleveland representatives, Ralph L. Fuller Associates, 616 St. Clair Ave., Cleveland, Ohio.

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Industrial Finishing
MAGAZINE

Issued fifteenth of each month. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

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EDITORIAL

Research Continues

Research among industrial finish manufacturers still goes ceaselessly on, and new developments which are of great help to the finisher are continually announced and marketed.

This field, which for so many years, practically stood still seems to have taken on a new life, due to recent business conditions, and it has been apparently an accepted fact that the manufacturer who will best succeed in securing for himself his share of the world's depleted purchasing power is the one who most closely studies the needs and wants of the industrial finisher.

Not least among these recent developments has been the combination of synthetic and nitrocellulose bases, which seem to offer the best features of both materials, with a minimizing of the lacks and disadvantages of both products.

Through this coalition it has been possible to secure a high degree of opacity, or covering ability, quick drying, sufficient elasticity to make it abrasive, alkali and oil resistant, and enough quick hardening power to enable pieces to be sprayed, packed and shipped within four to six hours.

This material, as well as numerous other recent developments only goes to show the immense possibilities presented by the industrial finishing field when force of circumstances and a need for business arouse thinking men to action.

What will be the next major development?

Improved Metal Primers

It is doubtful if there is any operation or material used in the field of metal finishing that is of more importance than the first or priming coat. On this coat depends the success or failure of all subsequent coatings, since if it breaks loose from the metal all others must go too. Also, if through any neglect or carelessness in proper covering, a crack or opening is left for air, moisture or other foreign matter to intrude, under-surface action takes place which will eventually spread like ink on a blotter.

It is therefore imperative that the proper kind of primer, as well as careful workmanship be used on all metal which is expected to have a lasting finish. The old days of confinement to only a red lead primer have gone, and it is now easy to secure specially made primers which will withstand any action of exposure, if through any chance the films of succeeding

coats become broken or damaged.

The best metal primer is rust inhibitive, tenacious enough to adhere to the metal, elastic enough to withstand any fracture by bending, or contraction and expansion caused by temperature changes, and must have a surface to which the following coats will tooth in.

All of these requirements may seem colossal for one kind of finish, but they are all incorporated in some primers which are being marketed today.

"Inter-Society Color Council"

The widespread demand in industry and art for greater uniformity in the standardization and designation of colors has resulted in the organization of the "Inter-Society Color Council" which is now in its formative stage, although the first meeting has been held in New York City.

Factors which have played a prominent part in the development of this color council are: The great expansion in the common use of color names by the public; the improved methods of designating colors on color charts; the great development and use of color tests in chemistry and other sciences; the need for more exact specification of colors in industry; the great desire for more specific dictionary definitions of colors.

The aims and purposes are to stimulate and coordinate the work being done by the various societies and associations leading to the standardization, description and specification of color, and to promote the practical application of these results to the color problems arising in science, art and industry. The members will be national societies and associations interested in color and operating on a non-profit basis. There are also associates, cooperating associates and sustaining associates. Any person interested in color may become a cooperating associate, and any organization not eligible for membership may also become a cooperating associate.

There is a charter membership of 20 national societies and associations. The only commercial color organization represented is the Textile Color Card Association.

DECORATION to be effective must be correct. Finish material manufacturers are familiar with the latest styles and some of them offer free information and style service to their customers.

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Barrel to barrel . . . tank to tank . . . the wise foreman of the busy shop keeps *«Hy-Speed»* Mixers everlastingly at their efficient work; mixing batch after batch of finishing materials or their ingredients.

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In New Jersey, manufacturing a complete line of lacquer finishing materials for every purpose, has an opening for two salesmen in New England and Pennsylvania, on a strictly commission basis. There will be close coöperation, quick service, and a better than average opportunity to earn more than an ordinary income. This offer will appeal to two men who have a knowledge of finishing materials and a following in the industrial field. Address IF-436, care Industrial Finishing.

Letters

(Continued from page 4)

which were claimed to be lacquer finished by the tumbling process. When it comes to a real production basis, well I am from Missouri—I want to be shown. I have contacted practically every wood-turning plant in the New England states and would be pleased to have some of the professional lacquer tumblers that have personally done a satisfactory job, advise me of the plant in New England where I can witness the process of a successful lacquer tumbling job.—J. E. Greene (Demonstrator).

Rubbing, Polishing, Buffing

In your 1932 issue, April, we refer to page 17—an article on rubbing, polishing and buffing—and are interested to know the name of the manufacturer whose rubbing machine is described in this article.—K. Bros. (Furniture Manufacturer)

Stains for Wood

In your Feb. 1930, issue, on pages 80 and 81, there appears an article by Phillip Myers concerning a wood stain which he recommends in place of a water stain. Is it good for spraying and handwork? Does it lack something in any important essential? Has it a tendency to fade? If it's okay please give me the name and address of the manufacturer. Probably there are better stains on the market today, where water is omitted. I am also interested in veneer inlay work on novelties and cabinets.—C. T.

INDUSTRIAL SALESMEN

Well established manufacturer of complete line of industrial varnishes, lacquers, enamels and synthetic products. Have openings, Jamestown, Cleveland, North Carolina and Boston. Proven producers only need apply. Address IF-435, care Industrial Finishing.

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